



# SEQUENCE LISTING

<110> Lim, Moon Young  
Edwards, Cynthia A.  
Fry, Kirk E.  
Bruice, Thomas W.  
Starr, Douglas B.  
Laurance, Megan E.  
Kwok, Yan

<120> DNA Binding Compound-Mediated Molecular  
Switch System

<130> 4600-0130.30

<140> US 09/518,297

<141> 2000-03-03

<150> US 60/122,513

<151> 1999-03-03

<150> US 60/154,605

<151> 1999-09-17

<160> 77

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 11

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA response element

<400> 1

cgttcgact t

11

<210> 2

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA response element

<400> 2

cggagtactg tcctccg

17

<210> 3

<211> 12

<212> DNA

<213> Artificial Sequence

<220>  
 <223> DNA response element

<221> misc\_feature  
 <222> (1)...(12)  
 <223> n = A,T,C or G

<400> 3  
 taattanggg ng

12

<210> 4  
 <211> 551  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <221> VARIANT  
 <222> (0)...(0)  
 <223> transcriptional regulatory protein

<400> 4  
 Met Asp Glu Leu Phe Pro Leu Ile Phe Pro Ala Glu Pro Ala Gln Ala  
 1 5 10 15  
 Ser Gly Pro Tyr Val Glu Ile Ile Glu Gln Pro Lys Gln Arg Gly Met  
 20 25 30  
 Arg Phe Arg Tyr Lys Cys Glu Gly Arg Ser Ala Gly Ser Ile Pro Gly  
 35 40 45  
 Glu Arg Ser Thr Asp Thr Thr Lys Thr His Pro Thr Ile Lys Ile Asn  
 50 55 60  
 Gly Tyr Thr Gly Pro Gly Thr Val Arg Ile Ser Leu Val Thr Lys Asp  
 65 70 75 80  
 Pro Pro His Arg Pro His Pro His Glu Leu Val Gly Lys Asp Cys Arg  
 85 90 95  
 Asp Gly Phe Tyr Glu Ala Glu Leu Cys Pro Asp Arg Cys Ile His Ser  
 100 105 110  
 Phe Gln Asn Leu Gly Ile Gln Cys Val Lys Lys Arg Asp Leu Glu Gln  
 115 120 125  
 Ala Ile Ser Gln Arg Ile Gln Thr Asn Asn Asn Pro Phe Gln Val Pro  
 130 135 140  
 Ile Glu Glu Gln Arg Gly Asp Tyr Asp Leu Asn Ala Val Arg Leu Cys  
 145 150 155 160  
 Phe Gln Val Thr Val Arg Asp Pro Ser Gly Arg Pro Leu Arg Leu Pro  
 165 170 175  
 Pro Val Leu Pro His Pro Ile Phe Asp Asn Arg Ala Pro Asn Thr Ala  
 180 185 190  
 Glu Leu Lys Ile Cys Arg Val Asn Arg Asn Ser Gly Ser Cys Leu Gly  
 195 200 205  
 Gly Asp Glu Ile Phe Leu Leu Cys Asp Lys Val Gln Lys Glu Asp Ile  
 210 215 220  
 Glu Val Tyr Phe Thr Gly Pro Gly Trp Glu Ala Arg Gly Ser Phe Ser  
 225 230 235 240  
 Gln Ala Asp Val His Arg Gln Val Ala Ile Val Phe Arg Thr Pro Pro  
 245 250 255  
 Tyr Ala Asp Pro Ser Leu Gln Ala Pro Val Arg Val Ser Met Gln Leu  
 260 265 270  
 Arg Arg Pro Ser Asp Arg Glu Leu Ser Glu Pro Met Glu Phe Gln Tyr  
 275 280 285

Leu Pro Asp Thr Asp Asp Arg His Arg Ile Glu Glu Lys Arg Lys Arg  
 290 295 300  
 Thr Tyr Glu Thr Phe Lys Ser Ile Met Lys Lys Ser Pro Phe Ser Gly  
 305 310 315 320  
 Pro Thr Asp Pro Arg Pro Pro Arg Arg Ile Ala Val Pro Ser Arg  
 325 330 335  
 Ser Ser Ala Ser Val Pro Lys Pro Ala Pro Gln Pro Tyr Pro Phe Thr  
 340 345 350  
 Ser Ser Leu Ser Thr Ile Asn Tyr Asp Glu Phe Pro Thr Met Val Phe  
 355 360 365  
 Pro Ser Gly Gln Ile Ser Gln Ala Ser Ala Leu Ala Pro Ala Pro Pro  
 370 375 380  
 Gln Val Leu Pro Gln Ala Pro Ala Pro Ala Pro Ala Pro Ala Met Val  
 385 390 395 400  
 Ser Ala Leu Ala Gln Ala Pro Ala Pro Val Pro Val Leu Ala Pro Gly  
 405 410 415  
 Pro Pro Gln Ala Val Ala Pro Pro Ala Pro Lys Pro Thr Gln Ala Gly  
 420 425 430  
 Glu Gly Thr Leu Ser Glu Ala Leu Leu Gln Leu Gln Phe Asp Asp Glu  
 435 440 445  
 Asp Leu Gly Ala Leu Leu Gly Asn Ser Thr Asp Pro Ala Val Phe Thr  
 450 455 460  
 Asp Leu Ala Ser Val Asp Asn Ser Glu Phe Gln Gln Leu Leu Asn Gln  
 465 470 475 480  
 Gly Ile Pro Val Ala Pro His Thr Thr Glu Pro Met Leu Met Glu Tyr  
 485 490 495  
 Pro Glu Ala Ile Thr Arg Leu Val Thr Gly Ala Gln Arg Pro Pro Asp  
 500 505 510  
 Pro Ala Pro Ala Pro Leu Gly Ala Pro Gly Leu Pro Asn Gly Leu Leu  
 515 520 525  
 Ser Gly Asp Glu Asp Phe Ser Ser Ile Ala Asp Met Asp Phe Ser Ala  
 530 535 540  
 Leu Leu Ser Gln Ile Ser Ser  
 545 550

<210> 5  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> DNA response element

<400> 5  
 tccctatcag tgatagaga

19

<210> 6  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> response element

<400> 6  
 cttaacactc gcgagtgtta ag

22

<210> 7  
 <211> 13  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> response element

<221> misc\_feature  
 <222> (3)...(3)  
 <223> n = G or T

<221> misc\_feature  
 <222> (7)...(7)  
 <223> n = A,T,C or G

<221> misc\_feature  
 <222> (12)...(12)  
 <223> n = A or C

<400> 7  
 rgntcantga cny

13

<210> 8  
 <211> 77  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> activator sequence

<400> 8  
 Ala Pro Pro Thr Asp Val Ser Leu Gly Asp Glu Leu His Leu Asp Gly  
   1                  5                  10                  15  
 Glu Asp Val Ala Met Ala His Ala Asp Ala Leu Asp Asp Phe Asp Leu  
                   20                  25                  30  
 Asp Met Leu Gly Asp Gly Asp Ser Pro Gly Pro Gly Phe Thr Pro His  
           35                  40                  45  
 Asp Ser Ala Pro Tyr Gly Ala Leu Asp Met Ala Asp Phe Glu Phe Glu  
           50                  55                  60  
 Gln Met Phe Thr Asp Ala Leu Gly Ile Asp Glu Tyr Gly  
 65                  70                  75

<210> 9  
 <211> 11  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> activator sequence

<221> VARIANT  
 <222> (1)...(11)  
 <223> tetramer

<400> 9  
 Asp Ala Leu Asp Asp Phe Asp Leu Asp Met Leu

1 5 10

<210> 10  
 <211> 97  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> repressor sequence

<400> 10  
 Met Asp Ala Lys Ser Leu Thr Ala Trp Ser Arg Thr Leu Val Thr Phe  
 1 5 10 15  
 Lys Asp Val Phe Val Asp Phe Thr Arg Glu Glu Trp Lys Leu Leu Asp  
 20 25 30  
 Thr Ala Gln Gln Ile Val Tyr Arg Asn Val Met Leu Glu Asn Tyr Lys  
 35 40 45  
 Asn Leu Val Ser Leu Gly Tyr Gln Leu Thr Lys Pro Asp Val Ile Leu  
 50 55 60  
 Arg Leu Glu Lys Gly Glu Glu Pro Trp Leu Val Glu Arg Glu Ile His  
 65 70 75 80  
 Gln Glu Thr His Pro Asp Ser Glu Thr Ala Phe Glu Ile Lys Ser Ser  
 85 90 95  
 Val

<210> 11  
 <211> 36  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> repressor sequence

<400> 11  
 Met Ala Ala Ala Val Arg Met Asn Ile Gln Met Leu Leu Glu Ala Ala  
 1 5 10 15  
 Asp Tyr Leu Glu Arg Arg Glu Arg Glu Ala Glu His Gly Tyr Ala Ser  
 20 25 30  
 Met Leu Pro Tyr  
 35

<210> 12  
 <211> 116  
 <212> DNA  
 <213> Escherichia coli

<220>  
 <221> misc\_feature  
 <222> (0)...(0)  
 <223> partial promoter sequence

<400> 12  
 cgcggtcaga aaattatattt aaatttcctc ttgtcaggcc ggaataactc cctataatgc 60  
 gccaccactg acacggaaca acggcaaaca cgccgccggg tcagcggggt tctcct 116

<210> 13

<211> 22  
 <212> DNA  
 <213> Escherichia coli  
  
 <220>  
 <221> misc\_feature  
 <222> (0)...(0)  
 <223> partial promoter sequence  
  
 <400> 13  
 agaaaattat tttaaatttc ct 22  
  
 <210> 14  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> modified promoter sequence  
  
 <400> 14  
 gactgcagtg gtacctagga gg 22  
  
 <210> 15  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> modified promoter sequence  
  
 <400> 15  
 agaaaattat tttaaatttc ct 22  
  
 <210> 16  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> modified promoter sequence  
  
 <400> 16  
 ggaaaatttt ttttcaaaag ta 22  
  
 <210> 17  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> modified promoter sequence  
  
 <400> 17  
 tgaaatttat tttgcgaaag gg 22  
  
 <210> 18

<211> 11  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 18  
 tgttcgact t 11  
  
 <210> 19  
 <211> 52  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 19  
 catggacgcc actgagccgt ttttgttcgc acttgaggcg agtcgatgca cc 52  
  
 <210> 20  
 <211> 54  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 20  
 catggacgcc actgagccgt gttcgactt ttttttgagg cgagtcgatg cacc 54  
  
 <210> 21  
 <211> 58  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 21  
 catggacgcc actgagccgt ttttgttcgc actttttttt gaggcgagtc gatgcacc 58  
  
 <210> 22  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 22  
 cttaaaaata ac 12  
  
 <210> 23  
 <211> 16  
 <212> DNA

<213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 23  
 ttgaaaaatc aacgct 16  
 <210> 24  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 24  
 tttttgttcg cacttttttt t 21  
 <210> 25  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 25  
 tttttgggat tttccttttt 20  
 <210> 26  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 26  
 aaaaaattgt gagcgctcac aatttttt 28  
 <210> 27  
 <211> 6  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> tissue-specific transcription factor  
 <400> 27  
 acttta 6  
 <210> 28  
 <211> 9  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered DNA response element  
  
 <400> 28  
 taccgacat 9  
  
 <210> 29  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 29  
 gggactttcc 10  
  
 <210> 30  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 30  
 gggattttcc 10  
  
 <210> 31  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 31  
 cgaccgtgct cgagttaacg ggactttcca aaaacgatcg gactggactc 50  
  
 <210> 32  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 32  
 cgaccgtgct cgagttaacg ggattttcca aaaacgatcg gactggactc 50  
  
 <210> 33  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element

<400> 33 cgaccgtgct cgagaaattg ggattttcca aaaacgatcg gactggactc	50
<210> 34 <211> 28 <212> DNA <213> Artificial Sequence	
<220> <223> engineered DNA response element	
<400> 34 aaaaaattgt gagcgctcac aatttttt	28
<210> 35 <211> 25 <212> DNA <213> Artificial Sequence	
<220> <223> engineered DNA response element	
<400> 35 ttttttttgt gagcggataa caaaa	25
<210> 36 <211> 10 <212> DNA <213> Artificial Sequence	
<220> <223> engineered DNA response element	
<400> 36 tctgggatcc	10
<210> 37 <211> 14 <212> DNA <213> Artificial Sequence	
<220> <223> engineered DNA response element	
<400> 37 gagttttttt taag	14
<210> 38 <211> 14 <212> DNA <213> Artificial Sequence	
<220> <223> engineered DNA response element	
<400> 38	

gagttttaaa agag

14

<210> 39

<211> 969

<212> PRT

<213> Homo sapiens

<220>

<221> VARIANT

<222> (0)...(0)

<223> transcriptional regulatory protein

<400> 39

Met	Ala	Glu	Asp	Asp	Pro	Tyr	Leu	Gly	Arg	Pro	Glu	Gln	Met	Phe	His
1				5					10					15	
Leu	Asp	Pro	Ser	Leu	Thr	His	Thr	Ile	Phe	Asn	Pro	Glu	Val	Phe	Gln
			20					25					30		
Pro	Gln	Met	Ala	Leu	Pro	Thr	Ala	Asp	Gly	Pro	Tyr	Leu	Gln	Ile	Leu
		35					40					45			
Glu	Gln	Pro	Lys	Gln	Arg	Gly	Phe	Arg	Phe	Arg	Tyr	Val	Cys	Glu	Gly
	50					55					60				
Pro	Ser	His	Gly	Gly	Leu	Pro	Gly	Ala	Ser	Ser	Glu	Lys	Asn	Lys	Lys
65					70				75					80	
Ser	Tyr	Pro	Gln	Val	Lys	Ile	Cys	Asn	Tyr	Val	Gly	Pro	Ala	Lys	Val
			85					90						95	
Ile	Val	Gln	Leu	Val	Thr	Asn	Gly	Lys	Asn	Ile	His	Leu	His	Ala	His
		100					105					110			
Ser	Leu	Val	Gly	Lys	His	Cys	Glu	Asp	Gly	Ile	Cys	Thr	Val	Thr	Ala
	115						120					125			
Gly	Pro	Lys	Asp	Met	Val	Val	Gly	Phe	Ala	Asn	Leu	Gly	Ile	Leu	His
	130				135						140				
Val	Thr	Lys	Lys	Lys	Val	Phe	Glu	Thr	Leu	Glu	Ala	Arg	Met	Thr	Glu
145					150					155					160
Ala	Cys	Ile	Arg	Gly	Tyr	Asn	Pro	Gly	Leu	Leu	Val	His	Pro	Asp	Leu
			165					170						175	
Ala	Tyr	Leu	Gln	Ala	Glu	Gly	Gly	Gly	Asp	Arg	Gln	Leu	Gly	Asp	Arg
		180					185						190		
Glu	Lys	Glu	Leu	Ile	Arg	Gln	Ala	Ala	Leu	Gln	Gln	Thr	Lys	Glu	Met
	195					200						205			
Asp	Leu	Ser	Val	Val	Arg	Leu	Met	Phe	Thr	Ala	Phe	Leu	Pro	Asp	Ser
	210					215					220				
Thr	Gly	Ser	Phe	Thr	Arg	Arg	Leu	Glu	Pro	Val	Val	Ser	Asp	Ala	Ile
225					230					235					240
Tyr	Asp	Ser	Lys	Ala	Pro	Asn	Ala	Ser	Asn	Leu	Lys	Ile	Val	Arg	Met
			245					250						255	
Asp	Arg	Thr	Ala	Gly	Cys	Val	Thr	Gly	Gly	Glu	Glu	Ile	Tyr	Leu	Leu
		260					265						270		
Cys	Asp	Lys	Val	Gln	Lys	Asp	Asp	Ile	Gln	Ile	Arg	Phe	Tyr	Glu	Glu
	275					280						285			
Glu	Glu	Asn	Gly	Gly	Val	Trp	Glu	Gly	Phe	Gly	Asp	Phe	Ser	Pro	Thr
	290				295						300				
Asp	Val	His	Arg	Gln	Phe	Ala	Ile	Val	Phe	Lys	Thr	Pro	Lys	Tyr	Lys
305				310						315					320
Asp	Ile	Asn	Ile	Thr	Lys	Pro	Ala	Ser	Val	Phe	Val	Gln	Leu	Arg	Arg
			325					330						335	
Lys	Ser	Asp	Leu	Glu	Thr	Ser	Glu	Pro	Lys	Pro	Phe	Leu	Tyr	Tyr	Pro
		340					345						350		

Glu	Ile	Lys	Asp	Lys	Glu	Glu	Val	Gln	Arg	Lys	Arg	Gln	Lys	Leu	Met	355	360	365
Pro	Asn	Phe	Ser	Asp	Ser	Phe	Gly	Gly	Gly	Ser	Gly	Ala	Gly	Ala	Gly	370	375	380
Gly	Gly	Gly	Met	Phe	Gly	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Thr	Gly	Ser	385	390	395
Thr	Gly	Pro	Gly	Tyr	Ser	Phe	Pro	His	Tyr	Gly	Phe	Pro	Thr	Tyr	Gly	405	410	415
Gly	Ile	Thr	Phe	His	Pro	Gly	Thr	Thr	Lys	Ser	Asn	Ala	Gly	Met	Lys	420	425	430
His	Gly	Thr	Met	Asp	Thr	Glu	Ser	Lys	Lys	Asp	Pro	Glu	Gly	Cys	Asp	435	440	445
Lys	Ser	Asp	Asp	Lys	Asn	Thr	Val	Asn	Leu	Phe	Gly	Lys	Val	Ile	Glu	450	455	460
Thr	Thr	Glu	Gln	Asp	Gln	Glu	Pro	Ser	Glu	Ala	Thr	Val	Gly	Asn	Gly	465	470	475
Glu	Val	Thr	Leu	Thr	Tyr	Ala	Thr	Gly	Thr	Lys	Glu	Glu	Ser	Ala	Gly	485	490	495
Val	Gln	Asp	Asn	Leu	Phe	Leu	Glu	Lys	Ala	Met	Gln	Leu	Ala	Lys	Arg	500	505	510
His	Ala	Asn	Ala	Leu	Phe	Asp	Tyr	Ala	Val	Thr	Gly	Asp	Val	Lys	Met	515	520	525
Leu	Leu	Ala	Val	Gln	Arg	His	Leu	Thr	Ala	Val	Gln	Asp	Glu	Asn	Gly	530	535	540
Asp	Ser	Val	Leu	His	Leu	Ala	Ile	Ile	His	Leu	His	Ser	Gln	Leu	Val	545	550	555
Arg	Asp	Leu	Leu	Glu	Val	Thr	Ser	Gly	Leu	Ile	Ser	Asp	Asp	Ile	Ile	565	570	575
Asn	Met	Arg	Asn	Asp	Leu	Tyr	Gln	Thr	Pro	Leu	His	Leu	Ala	Val	Ile	580	585	590
Thr	Lys	Gln	Glu	Asp	Val	Val	Glu	Asp	Leu	Leu	Arg	Ala	Gly	Ala	Asp	595	600	605
Leu	Ser	Leu	Leu	Asp	Arg	Leu	Gly	Asn	Ser	Val	Leu	His	Leu	Ala	Ala	610	615	620
Lys	Glu	Gly	His	Asp	Lys	Val	Leu	Ser	Ile	Leu	Leu	Lys	His	Lys	Lys	625	630	635
Ala	Ala	Leu	Leu	Leu	Asp	His	Pro	Asn	Gly	Asp	Gly	Leu	Asn	Ala	Ile	645	650	655
His	Leu	Ala	Met	Met	Ser	Asn	Ser	Leu	Pro	Cys	Leu	Leu	Leu	Leu	Val	660	665	670
Ala	Ala	Gly	Ala	Asp	Val	Asn	Ala	Gln	Glu	Gln	Lys	Ser	Gly	Arg	Thr	675	680	685
Ala	Leu	His	Leu	Ala	Val	Glu	His	Asp	Asn	Ile	Ser	Leu	Ala	Gly	Cys	690	695	700
Leu	Leu	Leu	Glu	Gly	Asp	Ala	His	Val	Asp	Ser	Thr	Thr	Tyr	Asp	Gly	705	710	715
Thr	Thr	Pro	Leu	His	Ile	Ala	Ala	Gly	Arg	Gly	Ser	Thr	Arg	Leu	Ala	725	730	735
Ala	Leu	Leu	Lys	Ala	Ala	Gly	Ala	Asp	Pro	Leu	Val	Glu	Asn	Phe	Glu	740	745	750
Pro	Leu	Tyr	Asp	Leu	Asp	Asp	Ser	Trp	Glu	Asn	Ala	Gly	Glu	Asp	Glu	755	760	765
Gly	Val	Val	Pro	Gly	Thr	Thr	Pro	Leu	Asp	Met	Ala	Thr	Ser	Trp	Gln	770	775	780
Val	Phe	Asp	Ile	Leu	Asn	Gly	Lys	Pro	Tyr	Glu	Pro	Glu	Phe	Thr	Ser	785	790	795
Asp	Asp	Leu	Leu	Ala	Gln	Gly	Asp	Met	Lys	Gln	Leu	Ala	Glu	Asp	Val	800		

				805					810				815			
Lys	Leu	Gln	Leu	Tyr	Lys	Leu	Leu	Glu	Ile	Pro	Asp	Pro	Asp	Lys	Asn	
			820					825					830			
Trp	Ala	Thr	Leu	Ala	Gln	Lys	Leu	Gly	Leu	Gly	Ile	Leu	Asn	Asn	Ala	
		835					840					845				
Phe	Arg	Leu	Ser	Pro	Ala	Pro	Ser	Lys	Thr	Leu	Met	Asp	Asn	Tyr	Glu	
	850					855					860					
Val	Ser	Gly	Gly	Thr	Val	Arg	Glu	Leu	Val	Glu	Ala	Leu	Arg	Gln	Met	
865					870					875					880	
Gly	Tyr	Thr	Glu	Ala	Ile	Glu	Val	Ile	Gln	Ala	Ala	Ser	Ser	Pro	Val	
			885					890						895		
Lys	Thr	Thr	Ser	Gln	Ala	His	Ser	Leu	Pro	Leu	Ser	Pro	Ala	Ser	Thr	
			900					905					910			
Arg	Gln	Gln	Ile	Asp	Glu	Leu	Arg	Asp	Ser	Asp	Ser	Val	Cys	Asp	Thr	
	915						920					925				
Gly	Val	Glu	Thr	Ser	Phe	Arg	Lys	Leu	Ser	Phe	Thr	Glu	Ser	Leu	Thr	
	930					935					940					
Ser	Gly	Ala	Ser	Leu	Leu	Thr	Leu	Asn	Lys	Met	Pro	His	Asp	Tyr	Gly	
945				950						955					960	
Gln	Glu	Gly	Pro	Leu	Glu	Gly	Lys	Ile								
				965												

<210> 40

<211> 96

<212> DNA

<213> Artificial Sequence

<220>

<223> engineered regulatory sequence

<400> 40

gctagcccccg ccccggttgac gcaaattgggc ggtaggcgtg tacggtggga ggtttatata  
agcagagctc gtttagtgaa ccgtcagatc agatct

60

96

<210> 41

<211> 154

<212> DNA

<213> Artificial Sequence

<220>

<223> engineered regulatory sequence

<400> 41

gctagcgcgc aaattgggat tttccaaaaa gccgaaattg ggattttcca aaaaccgccc  
atgccccgc ccgttgacgc aaatgggcgg taggcgtgta cgggtggagg tttatataag  
cagagctcgt ttagtgaacc gtcagatcag atct

60

120

154

<210> 42

<211> 212

<212> DNA

<213> Artificial Sequence

<220>

<223> engineered regulatory sequence

<400> 42

acgcgtgccc aaattgggat tttccaaaaa gccgaaattg ggattttcca aaaaccgccc

60

tagcgcccaa attgggattt tccaaaaagc cgaaattggg attttccaaa aaccgccgat	120
cgcccgcccc gttgacgcaa atggggcggtg ggcgtgtacg gtgggaggtt tatataagca	180
gagctcgttt agtgaaccgt cagatcagat ct	212

<210> 43  
 <211> 96  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 43	
gctagccccg ccccgttgac gcaaattgggc ggtaggcgtg tacgggtggga ggtctatata	60
agcagagctc gtttagtgaa ccgtcagatc agatct	96

<210> 44  
 <211> 154  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 44	
gctagcgccc aggtcgggat tttccgagga gccgaggtcg ggattttccg aggaccgccg	60
atcgcccgcc ccgttgacgc aaatgggcgg taggcgtgta cgggtgggagg cctatataag	120
cagagctcgt ttagtgaacc gtcagatcag atct	154

<210> 45  
 <211> 154  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 45	
gctagcgccc aggtcgggat tttccgagga gccgaggtcg ggattttccg aggaccgccg	60
atcgcccgcc ccgttgacgc aaatgggcgg taggcgtgta cgggtgggagg cctatataag	120
cagagctcgt ttagtgaacc gtcagatcag atct	154

<210> 46  
 <211> 762  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered promoter construct

<400> 46	
ggtacctcaa tattggccat tagccatatt attcattggt tatatagcat aaattaatat	60
tggctattgg ccattgcata cgttgtatct atatcataat atgtacattt atattggctc	120
atgtccaata tgaccgccat gttggcattg attattgact agttattaat agtaatcaat	180
tacgggggtca ttagttcata gcccatatat ggagttccgc gttacataac ttacggtaaa	240
tggccgcct ggctgaccgc ccaacgaccc ccgcccattg acgtcaataa tgacgtatgt	300
tcccatagta acgcaaatag ggattttcca ttaacgtcaa tgggtggagt atttacggta	360

aactgccac	ttggcagtac	atcaagtgt	tcatatgcc	agtccgccc	ctattgacgt	420
caatgacggt	aaatggccc	cctggcatta	tgcccagtac	atgactttat	gggattttcc	480
tatttggcag	tacatctacg	tattagtc	cgctattacc	atgggtgatgc	ggttttggca	540
gtacaccaat	gggctggat	agcggtttga	ctcacgggga	tttccaagtc	tccaccccat	600
tgacgtcaat	gggagtttgt	tttggcacca	aggtaaaagg	gattttccaa	aatgtcgtaa	660
caactgcgat	cgcccgc	gttgacgcaa	atgggcggt	ggcgtgtacg	gtgggaggtt	720
tatataagca	gagctcgttt	agtgaaccgt	cagatcaagc	tt		762

<210> 47

<211> 762

<212> DNA

<213> Artificial Sequence

<220>

<223> engineered promoter construct

<400> 47

ggtacctcaa	tattggccat	tagccatatt	attcattggt	tatatagcat	aaattaatat	60
tggctattgg	ccattgcata	cgttgtatct	atatcataat	atgtacattt	atattggctc	120
atgtccaata	tgaccgcat	gttggcattg	attattgact	agttattaat	agtaatcaat	180
tacgggggtca	ttagttcata	gcccatatat	ggagttccgc	gttacataac	ttacggtaaa	240
tggcccgcct	ggctgaccgc	ccaacgaccc	ccgcccattg	acgtcaataa	tgacgtatgt	300
tcccatagta	acgcaaatat	tcccgggaaa	ttaacgtcaa	tgggtggagt	atttacggta	360
aactgccac	ttggcagtac	atcaagtgt	tcatatgcc	agtccgccc	ctattgacgt	420
caatgacggt	aaatggccc	cctggcatta	tgcccagtac	atgactttat	tctcgaggaa	480
tatttggcag	tacatctacg	tattagtc	cgctattacc	atgggtgatgc	ggttttggca	540
gtacaccaat	gggctggat	agcggtttga	ctcacgggga	tttccaagtc	tccaccccat	600
tgacgtcaat	gggagtttgt	tttggcacca	aggtaaaatt	acgcgtaaaa	aatgtcgtaa	660
caactgcgat	cgcccgc	gttgacgcaa	atgggcggt	ggcgtgtacg	gtgggaggtt	720
gctagccgca	gagctcgttt	agtgaaccgt	cagatcaagc	tt		762

<210> 48

<211> 762

<212> DNA

<213> Artificial Sequence

<220>

<223> engineered promoter construct

<400> 48

ggtacctcaa	tattggccat	tagccatatt	attcattggt	tatatagcat	aaatcaatat	60
tggctattgg	ccattgcata	cgttgtatct	atatcataat	atgtacattt	atattggctc	120
atgtccaata	tgaccgcat	gttggcattg	attattgact	agttattaat	agtaatcaat	180
tacgggggtca	ttagttcata	gcccatatat	ggagttccgc	gttacataac	ttacggtaaa	240
tggcccgcct	ggctgaccgc	ccaacgaccc	ccgcccattg	acgtcaataa	tgacgtatgt	300
tcccatagta	acgccaatag	ggactttcca	ttgacgtcaa	tgggtggagt	atttacggta	360
aactgccac	ttggcagtac	atcaagtgt	tcatatgcc	agtccgccc	ctattgacgt	420
caatgacggt	aaatggccc	cctggcatta	tgcccagtac	atgaccttac	gggactttcc	480
tacttggcag	tacatctacg	tattagtc	cgctattacc	atgggtgatgc	ggttttggca	540
gtacaccaat	gggctggat	agcggtttga	ctcacgggga	tttccaagtc	tccaccccat	600
tgacgtcaat	gggagtttgt	tttggcacca	aaatcaacgg	gactttccaa	aatgtcgtaa	660
caactgcgat	cgcccgc	gttgacgcaa	atgggcggt	ggcgtgtacg	gtgggaggtc	720
tatataagca	gagctcgttt	agtgaaccgt	cagatcaagc	tt		762

<210> 49

<211> 12

<212> DNA

<213> Artificial Sequence  
 <220>  
 <223> wild type regulatory sequence  
 <400> 49  
 gactgtttgt tt 12  
 <210> 50  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> wild type regulatory sequence  
 <400> 50  
 aggactcttg ga 12  
 <210> 51  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> wild type regulatory sequence  
 <400> 51  
 tactaggagg ctgtaggcat aaattggtct gcgcaccagc accatg 46  
 <210> 52  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered regulatory sequence  
 <400> 52  
 tactaggagg ctgtaggcat aaattagtct gcgcaccagc accatg 46  
 <210> 53  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered regulatory sequence  
 <400> 53  
 tactaggatt agtgcttaag cccttgggtct gcgcaccagc accatg 46  
 <210> 54  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 54  
 tactaggagg ctgtaggcat aaagctcgag tatacaacgc accatg 46

<210> 55  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 55  
 tactaggagg ctgtaggcat aaatgcgtaa aagcaccagc accatgcaac 50

<210> 56  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 56  
 tactaggagg ctgtaggcat aaattaataaa acgcaccagc accatgcaac 50

<210> 57  
 <211> 50  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 57  
 tactaggagg ctgtaggcat aaattaatcc gcgcaccagc accatgcaac 50

<210> 58  
 <211> 51  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 58  
 accttgaggc atacttcaaa gactgttgat ttagcgaata agaggagttg g 51

<210> 59  
 <211> 51  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered regulatory sequence

<400> 59  
accttgaggc atacttcaaa gactgtttat ttttaataacg ggaggagttg g 51

<210> 60  
<211> 51  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> engineered regulatory sequence

<400> 60  
accttgaggc atacttcaaa gactgtttat ttaaggactg ggaggagttg g 51

<210> 61  
<211> 6513  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> heterologous nucleic acid construct

<400> 61  
tcaatattgg ccattagcca tattattcat tggttatata gcataaatca atattggcta 60  
ttggccattg catacgttgt atctatatca taatatgtac atttatattg gctcatgtcc 120  
aatatgaccg ccatgttggc attgattatt gactagttat taatagtaat caattacggg 180  
gtcattagtt catagcccat atatggagtt ccgcgttaca taacttacgg taaatggccc 240  
gcctggctga ccgccaacg acccccgcgc attgacgtca ataatgacgt atgttcccat 300  
agtaacgcc aatagggact tccattgacg tcaatgggtg gagtatattac ggtaaaactgc 360  
ccacttggca gtacatcaag tgtatcatat gccaaagtccg cccctattg acgtcaatga 420  
cggtaaatgg cccgcctggc attatgccca gtacatgacc ttacgggact ttcctacttg 480  
gcagtacatc tacgtattag tcatcgctat taccatgggt atgcgggtttt ggcagtacac 540  
caatgggctg ggatagcggg ttgactcacg gggatttcca agtctccacc ccattgacgt 600  
caatgggagt ttgttttggc accaaaatca acgggacttt ccaaaatgtc gtaacaactg 660  
cgatcgcccg ccccggtgac gcaaatgggc ggtaggcgtg tacgggtggga ggtctatata 720  
agcagagctc gtttagtgaa ccgtcagatc actagaagct ttattgcggg agtttatcac 780  
agttaaattg ctaacgcagt cagtgtctct gacacaacag tctcgaactt aagctgcagt 840  
gactctctta aggtagcctt gcagaagttg gtcgtgaggg actgggcagg taagtatcaa 900  
ggttacaaga caggtttaag gagaccaata gaaactgggc ttgtcgagac agagaagact 960  
cttgcgtttc tgataggcac ctattggtct tactgacatc cactttgcct ttctctccac 1020  
agggtgccac tcccagttca attacagctc ttaaggctag agtacttaat acgactcact 1080  
ataggctagc cagcttgaag caagcctcct gaaagatgga ggcgtcgctg ccggcccagg 1140  
ccgccgagac ggaggaggtg ggtcttttcg tcgaaaaata cctccgggtcc gatgtcgcg 1200  
cggcggaat tgctcgctc atgcgcaacc tcaacagcct gatgggacgc acgcggttta 1260  
ttacctggc gttgctggag gcctgtctcc gcgttcccat ggccacccgc agcagcgcca 1320  
tatttcggcg gatctatgac cactacgcca cgggcgtcat cccacgac aacgtcaccg 1380  
gagagctgga gctcgtggcc ctgccccca ccctgaacgt aacccccgtc tgggagctgt 1440  
tgtgcctgtg cagcaccatg gccgcgcgcc tgcattggga ctggcgggcc gggggatctg 1500  
ggaggacctt cggccccgat gacgtgtgtg acctactgac cccccactac gaccgtaca 1560  
tgacgtggg gttcgaaact ggccaactgta acgtaaccga cggacttctg ctctcggagg 1620  
aagccgtcaa gcgcgtcgcc gacgccttaa gcggctgtcc cccgcgcggg tccgttagcg 1680  
agacggacca cgcgggtggc ctgttcaaga taatctgggg cgaactgttt ggcgtgcaga 1740  
tggccaaaag cacgcagacg tttcccgggg cggggcgcggt taaaaacctc accaaacaga 1800  
caatcgtggg gttgttgac gccaccaca tcgaccacag cgcttgcgg acccacaggc 1860  
agctgtacgc cctgcttatg gccacaagc gggagtttgc gggcgcgcg ttcaagctac 1920  
gcgtgcccgc gtggggcgcg tgtttgcgca cgcactcatc cagcgccaac cccaacgctg 1980

acatcatcct	ggaggcggcg	ctgtcggagc	tccccaccga	ggcctggccc	atgatgcagg	2040
gggcggtgaa	cttttagcacc	ctaatagaagc	tactgtcttc	tatcgaacaa	gcatgcccaa	2100
aaaagaagag	aaaggtagat	gaattcccgg	ggatctcgac	ggcccccccg	accgatgtca	2160
gcctggggga	cgagctccac	ttagacggcg	aggacgtggc	gatggcgcat	gccgacgcgc	2220
tagacgattt	cgatctggac	atgttggggg	acggggattc	cccgggtccg	ggatcgccag	2280
ggatccgtcg	acttgacgcg	ttgatatcat	ctagagcggc	cgcagggtacc	tgaataacta	2340
aggccgcttc	ccttttagtga	gggttaatgc	ttcgagcaga	catgataaga	tacattgatg	2400
agtttgga	aaccacaact	agaatgcagt	gaaaaaatg	ctttatttgt	gaaatttgtg	2460
atgctattgc	tttatttgta	accattataa	gctgcaataa	acaagttaac	aacaacaatt	2520
gcattcattt	tatgttttcag	gttcaggggg	agatgtggga	ggttttttaa	agcaagtaaa	2580
acctctacaa	atgtggtaaa	atccgataag	gatcgattcc	ggagcctgaa	tggcgaatgg	2640
acgcgcctcg	tagcggcgca	ttaagcgcg	cgggtgtggt	ggttacgcgc	acgtgacccg	2700
tacacttgcc	agcgccttag	cgcgcgtccc	tttcgctttc	ttcccttcct	ttctcgccac	2760
gttcgcccgc	tttccccgtc	aagctctaaa	tcgggggctc	cctttagggt	tccgatttag	2820
tgctttacgg	cacctcgacc	ccaaaaaact	tgattagggt	gatggttcac	gtagtgggcc	2880
atcgccctga	tagacggttt	ttcgcccttt	gacgttggag	tccacgttct	ttaatagtgg	2940
actcttgctc	caaactggaa	caacactcaa	ccctatctcg	gtctattctt	ttgatttata	3000
agggattttg	ccgatttcgg	cctattgggt	aaaaaatgag	ctgatttaac	aaaaatttaa	3060
cgcgaaattt	aacaaaatat	taacgcttac	aatttcgcct	gtgtaccttc	tgaggcggaa	3120
agaaccagct	gtggaatgtg	tgtcagttag	ggtgtggaaa	gtccccaggc	tccccagcag	3180
gcagaagtat	gcaaagcatg	catctcaatt	agtcagcaac	caggtgtgga	aagtccccag	3240
gctccccagc	aggcagaagt	atgcaaagca	tgcatctcaa	ttagtcagca	accatagtcc	3300
cgcccctaac	tccgcccata	ccgcccctaa	ctccgcccag	ttccgcccata	tctccgcccc	3360
atggctgact	aatttttttt	atztatgcag	aggccgaggc	cgcctcggcc	tctgagctat	3420
tccagaagta	gtgaggaggc	ttttttggag	gcctaggctt	ttgcaaaaag	cttgattctt	3480
ctgacacaac	agtctcgaac	ttaaggctag	agccaccatg	attgaacaag	atggattgca	3540
cgcaggttct	ccggccgctt	gggtggagag	gctattcggc	tatgactggg	cacaacagac	3600
aatcggctgc	tctgatgccg	ccgtgttccg	gctgtcagcg	caggggcgcc	cggttctttt	3660
tgtcaagacc	gacctgtccg	gtgccctgaa	tgaactgcag	gacgaggcag	cgcggtatc	3720
gtggctggcc	acgacgggcg	ttccttgccg	agctgtgtc	gacgttgtca	ctgaagcggg	3780
aagggactgg	ctgtatttgg	gcgaagtgcc	ggggcaggat	ctcctgtcat	ctcaccttgc	3840
tcttgccgag	aaagtattcca	tcatggctga	tgcaatgcgg	cggctgcata	cgcttgatcc	3900
ggctacctgc	ccattcgacc	accaagcgaa	acatcgcata	gagcagcac	gtactcggat	3960
ggaagccggt	cttgtcgatc	aggatgatct	ggacgaagag	catcaggggc	tcgcgccagc	4020
cgaactgttc	gccaggctca	aggcgcgcat	gcccagcggc	gaggatctcg	tcgtgaccca	4080
tggcgatgcc	tgcttgccga	atatcatggg	ggaaaatggc	cgcttttctg	gattcatcga	4140
ctgtggccgg	ctgggtgtgg	cggaccgcta	tcaggacata	gcgttggcta	cccgtgatata	4200
tgtgaagag	cttggcgggc	aatgggctga	ccgttctctc	gtgctttacg	gtatcgccgc	4260
tcccgatctg	cagcgcatcg	ccttctatcg	ccttcttgac	gagttcttct	gagcgggact	4320
ctgggggttcg	aaatgaccga	ccaagcgacg	cccaacctgc	catcacgatg	gccgcaataa	4380
aatatcttta	ttttcattac	atctgtgtgt	tggttttttg	tgtgaagatc	cgcgatgggt	4440
gcactctcag	tacaatctgc	tctgatgccg	catagttaag	ccagccccga	caccgcgcaa	4500
caccgcgtga	cgcgccctga	cgggcttgct	tgctcccggc	atccgcttac	agacaagctg	4560
tgaccgtctc	cgggagctgc	atgtgtcaga	ggttttcacc	gtcatcaccg	aaacgcgcga	4620
gacgaaagg	cctcgtgata	cgcctatttt	tatagggttaa	tgtcatgata	ataatggttt	4680
cttagacgtc	aggtggcact	tttcggggaa	atgtgcgcgg	aaccctattt	tgttttatttt	4740
tctaaataca	ttcaaataatg	tatccgctca	tgagacaata	accctgataa	atgcttcaat	4800
aatattgaaa	aaggaagagt	atgagtattc	aacatttccg	tgtcgccctt	attccctttt	4860
ttcgggcatt	ttgccttcct	gtttttgtct	accagaaaac	gctggtgaaa	gtaaaagatg	4920
ctgaagatca	gttgggtgca	cgagtgggtt	acatcgaact	ggatctcaac	agcggtaaga	4980
tccttgagag	ttttcgcccc	gaagaacggt	ttccaatgat	gagcactttt	aaagttctgc	5040
tatgtggcg	ggtatttatcc	cgtattgacg	ccgggcaaga	gcaactcggg	cgccgcatac	5100
actattctca	gaatgacttg	gttgagtact	caccagtcac	agaaaagcat	cttacggatg	5160
gcatgacagt	aagagaatta	tgcagtgtcg	ccataaccat	gagtataaac	actcgggcca	5220
acttacttct	gacaacgatc	ggaggaccga	aggagctaac	cgcttttttg	cacaacatgg	5280
gggatcatgt	aactcgcctt	gatcgttggg	aaccggagct	gaatgaagcc	ataccaaacg	5340
acgagcgtga	caccacgatg	cctgtagcaa	tggcaacaac	gttgcgcaaa	ctattaactg	5400

gcgaactact	tactctagct	tcccggcaac	aattaataga	ctggatggag	gcggataaag	5460
ttgcaggacc	acttctgcgc	tgggcccttc	cggtctggctg	gtttattgct	gataaatctg	5520
gagccggtga	gcgtgggtct	cgcggtatca	ttgcagcact	ggggccagat	ggtaagccct	5580
cccgtatcgt	agttatctac	acgacgggga	gtcaggcaac	tatggatgaa	cgaaatagac	5640
agatcgctga	gatagggtgcc	tcactgatta	agcattggta	actgtcagac	caagtttact	5700
catatatact	ttagattgat	ttaaaaacttc	atTTTTaatt	taaaaggatc	taggtgaaga	5760
tcctttttga	taatctcatg	acaaaaatcc	cttaacgtga	gttttcgttc	cactgagcgt	5820
cagaccccg	agaaaagatc	aaaggatctt	cttgagatcc	tttttttctg	cgcgtaatct	5880
gctgcttgca	aacaaaaaaa	ccaccgctac	cagcgggtgt	ttgtttgccg	gatcaagagc	5940
taccaactct	ttttccgaag	gtaactggct	tcagcagagc	gcagatacca	aatactgtcc	6000
ttctagtgtg	gccgtagtta	ggccaccact	tcaagaactc	tgtagcaccg	cctacatacc	6060
tcgctctgct	aatcctgtta	ccagtggctg	ctgccagtgg	cgataagtcg	tgtcttaccg	6120
ggttggtgact	aagacgatag	ttaccggata	aggcgcagcg	gtcgggctga	acgggggggtt	6180
cgtgcacaca	gcccagcttg	gagcgaacga	cctacaccga	actgagatac	ctacagcgtg	6240
agctatgaga	aagcgccacg	cttcccgaag	ggagaaaggc	ggacagggtat	ccggtaagcg	6300
gcagggtcgg	aacaggagag	cgcacgaggg	agcttccagg	gggaaacgcc	tggtatcttt	6360
atagtctctg	cggttttcgc	cacctctgac	ttgagcgtcg	atTTTTgtga	tgctcgtcag	6420
gggggaggag	cctatggaaa	aacgccagca	acgcggcctt	tttacggttc	ctggcctttt	6480
gctggccttt	tgctcacatg	gctcgacaga	tct			6513

<210> 62

<211> 6439

<212> DNA

<213> Artificial Sequence

<220>

<223> heterologous nucleic acid construct

<400> 62

tcaatattgg	ccattagcca	tattattcat	tggttatata	gcataaatca	atattggcta	60
ttggccattg	catacgttgt	atctatatca	taatatgtac	atTTatattg	gctcatgtcc	120
aatagcattg	ccatgttggc	attgattatt	gactagttaa	taatagtaat	caattacggg	180
gtcattagtg	catagcccat	atatggagtt	ccgcgttaca	taacttacgg	taaatggccc	240
gcctggctga	ccgccaacg	acccccgccc	attgacgtca	ataatgacgt	atgttcccat	300
agtaacgcca	atagggaactt	tccattgacg	tcaatgggtg	gagtatttac	ggtaaactgc	360
ccacttgcca	gtacatcaag	tgtatcatat	gccaaagtccg	ccccctattg	acgtcaatga	420
cggtaaatgg	ccgcctggc	attatgccca	gtacatgacc	ttacgggact	ttcctacttg	480
gcagtacatc	tacgtattag	tcacgctat	taccatgggtg	atgcgggtttt	ggcagtacac	540
caatgggcgt	ggatagcggg	ttgactcacg	gggatttcca	agtctccacc	ccattgacgt	600
caatgggagt	ttgttttggc	acaaaaatca	acgggacttt	ccaaaatgtc	gtaacaactg	660
cgatcgcccg	ccccgttgac	gcaaatgggc	ggtaggcgtg	tacgggtggga	ggtctatata	720
agcagagctc	gtttagtga	ccgtcagatc	actagaagct	ttattgcggg	agtttatcac	780
agttaaattg	ctaacgcagt	cagtgtctct	gacacaacag	tctcgaactt	aagctgcagt	840
gactctctta	aggtagcctt	gcagaagttg	gtcgtgaggc	actgggcagg	taagtatcaa	900
ggttacaaga	caggtttaag	gagaccaata	gaaactgggc	ttgtcgagac	agagaagact	960
cttgcgtttc	tgataggcac	ctatttgtct	tactgacatc	cactttgcct	ttctctccac	1020
aggtgtccac	tcccagttca	attacagctc	ttaaggctag	agtacttaat	acgactcact	1080
ataggctagc	cagcttgaag	caagcctcct	gaaagatgga	ggcgtcgctg	ccggcccagg	1140
ccgccgagac	ggaggagggtg	ggtcttttcg	tcgaaaaata	cctccgggtcc	gatgtcgcgc	1200
cggcggaatc	tgtcgcgctc	atgcgcaacc	tcaacagcct	gatgggacgc	acgcggttta	1260
tttacctggc	gttgctggag	gcctgtctcc	cgttcccat	ggccaccgc	agcagcgcca	1320
tatttcggcg	gatctatgac	cactacgcca	cgggcgtcat	ccccacgatc	aacgtcaccg	1380
gagagctgga	gctcgtggcc	ctgcccccca	ccctgaacgt	aacccccgtc	tgggagctgt	1440
tgtgcctgtg	cagcaccatg	gccgcgcgcc	tgcattggga	ctcggcgggc	gggggatctg	1500
ggaggacctt	cggccccgat	gacgtgctgg	acctactgac	ccccactac	gaccgctaca	1560
tgcagctggg	gttcgaactg	ggccactgta	acgtaaccga	cggacttctg	ctctcggagg	1620
aagccgtcaa	gcgcgtcgcc	gacgccttaa	gcggctgtcc	cccgcgcggg	tccggttagcg	1680

agacggacca	cgcggtggcg	ctgttcaaga	taatctgggg	cgaactgttt	ggcgtgcaga	1740
tggccaaaag	cacgcagacg	tttcccgggg	cggggcgcgt	taaaaacctc	accaaacaga	1800
caatcgtggg	gttggtggac	gcccaccaca	tcgaccacag	cgcttgcggg	accacaggc	1860
agctgtacgc	cctgcttatg	gcccacaagc	gggagtttgc	gggcgcgcg	ttcaagctac	1920
gcggtgcccgc	gtggggcgcg	tgtttgcgca	cgactcatc	cagcgccaac	cccaacgctg	1980
acatcatcct	ggaggcgggc	ctgtcggagc	tccccaccga	ggcctggccc	atgatgcagg	2040
gggcggtgaa	ctttagcacc	ctaccaaaaa	agaagagaaa	ggtagatcgg	acactggtga	2100
ccttcaagga	tgtatttgtg	gacttcacca	gggaggagtg	gaagctgctg	gacactgctc	2160
agcagatcgt	gtacagaaat	gtgatgctgg	agaactataa	gaacctgggt	tccttggggt	2220
attgatgaga	tatcatctag	agcggccgca	ggtacctgaa	taactaaggc	cgcttccctt	2280
tagtgagggg	taatgcttcg	agcagacatg	ataagataca	ttgatgagtt	tggacaaacc	2340
acaactagaa	tgacgtgaaa	aaaatgcttt	atttgtgaaa	tttgtgatgc	tattgcttta	2400
tttghtaacca	ttataagctg	caataaaca	gttaacaaca	acaattgcat	tcattttatg	2460
tttcaggttc	agggggagat	gtgggaggtt	ttttaagca	agtaaaacct	ctacaaatgt	2520
ggtaaaatcc	gataaggatc	gattccggag	cctgaatggc	gaatggacgc	gccctgtagc	2580
ggcgcattaa	gcgcggcggg	tgtggtggtt	acgcgcacgt	gaccgctaca	cttgccagcg	2640
ccctagcgcc	cgctcctttc	gctttcttcc	cttcctttct	cgccacgttc	gccggctttc	2700
cccgtaagc	tctaaatcgg	gggctccctt	taggggtccg	atttagtgct	ttacggcacc	2760
tcgaccccaa	aaaacttgat	taggggtgat	gttcacgtag	tgggccatcg	ccctgataga	2820
cggtttttcg	ccctttgacg	ttggagtcca	cgttctttaa	tagtggactc	ttgttccaaa	2880
ctggaacaac	actcaaccct	atctcgggtc	attcttttga	tttataaggg	atthttgccga	2940
tttcggccta	ttggttaaaa	aatgagctga	tttaacaaaa	atttaacgcg	aattttaaca	3000
aaatattaac	gcttacaatt	tcgcctgtgt	accttctgag	gcggaagaa	ccagctgtgg	3060
aatgtgtgtc	agttaggggtg	tggaaagtcc	ccaggctccc	cagcaggcag	aagtatgcaa	3120
agcatgcac	tcaattagtc	agcaaccagg	tgtggaaagt	ccccaggctc	cccagcaggc	3180
agaagtatgc	aaagcatgca	tctcaattag	tcagcaacca	tagtcccggc	cctaactccg	3240
cccatcccgc	ccctaactcc	gcccagttcc	gcccattctc	cgccccatgg	ctgactaatt	3300
ttttttat	atgcagaggc	cgaggccgcc	tcggcctctg	agctattcca	gaagtagtga	3360
ggaggctttt	ttggaggcct	aggcttttgc	aaaaagcttg	attcttctga	cacaacagtc	3420
tcgaacttaa	ggctagagcc	accatgattg	aacaagatgg	attgcacgca	ggttctccgg	3480
ccgcttgggt	ggagaggcta	ttcggctatg	actgggcaca	acagacaatc	ggctgtctcg	3540
atgcgcgggt	gttcgggctg	tcagcgagg	ggcgccgggt	tctttttgtc	aagaccgacc	3600
tgtccgggtg	cctgaatgaa	ctgcaggacg	aggcagcgcg	gctatcgtgg	ctggccacga	3660
cgggcgttcc	ttgcgcagct	gtgctcgacg	ttgtcactga	agcgggaagg	gactggctgc	3720
tattgggcga	agtgcggggg	caggatctcc	tgtcatctca	ccttgctcct	gccgagaaag	3780
tatccatcat	ggctgatgca	atgcggcggc	tgcatcacgt	tgatccggct	acctgcccac	3840
tcgaccacca	agcgaaacat	cgcatcgagc	gagcacgtac	tcggatggaa	gccgggtctt	3900
tcgatcagga	tgatctggac	gaagagcatc	aggggctcgc	gccagccgaa	ctgttcgcca	3960
ggctcaaggc	gcgcatgccc	gacggcgagg	atctcgtcgt	gacccatggc	gatgcctgct	4020
tgccgaatat	catggtggaa	aatggccgct	tttctggatt	catcgactgt	ggccggctgg	4080
gtgtggcgga	ccgctatcag	gacatagcgt	tggctacccg	tgatattgct	gaagagcttg	4140
gcggcgaaatg	ggctgaccgc	ttcctcgtgc	tttacgggat	cgccgctccc	gattcgacgc	4200
gcatcgccct	ctatcgccct	cttgacgagt	tcttctgagc	gggactctgg	ggttcgaaat	4260
gaccgacca	gcgacgccc	acctgccatc	acgatggccg	caataaaaata	tctttat	4320
cattacatct	gtgtgttgg	tttttgtgtg	aagatccgcg	tatggtgcac	tctcagtaca	4380
atctgctctg	atgcgcgata	gttaagccag	ccccgacacc	cgccaacacc	cgctgacgcg	4440
ccctgacggg	cttgctgct	cccggcatcc	gcttacagac	aagctgtgac	cgctccgggg	4500
agctgcatgt	gtcagagggt	ttcaccgtca	tcaccgaaac	gcgcgagacg	aaagggcctc	4560
gtgatacgcc	tatttttata	ggttaatgtc	atgataataa	tggtttctta	gacgtcaggt	4620
ggcacttttc	ggggaatgt	gcgcggaacc	cctatttgtt	tatttttcta	aatacattca	4680
aatatgtatc	cgctcatgag	acaataaccc	tgataaatgc	ttcaataata	ttgaaaaagg	4740
aagagtatga	gtattcaaca	tttccgtgtc	gcccttattc	ccttttttgc	ggcattttgc	4800
cttcctgttt	ttgctcacc	agaaaacgctg	gtgaaagtaa	aagatgctga	agatcagttg	4860
ggtgcacgag	tgggttacat	cgaactggat	ctcaacagcg	gtaagatcct	tgagagtttt	4920
cgccccgaag	aacgttttcc	aatgatgagc	actttttaaag	ttctgctatg	tggcgcggtg	4980
ttatcccgta	ttgacgccc	gcaagagcaa	ctcggctgcc	gcatacacta	ttctcagaat	5040
gacttggttg	agtactcacc	agtcacagaa	aagcatctta	cggatggcat	gacagtaaga	5100

gaattatgca	gtgctgccat	aaccatgagt	gataaactg	cggccaactt	acttctgaca	5160
acgatcggag	gaccgaagga	gctaaccgct	tttttgcaca	acatggggga	tcatgtaact	5220
cgccttgatc	gttgggaacc	ggagctgaat	gaagccatac	caaacgacga	gcgtgacacc	5280
acgatgcctg	tagcaatggc	aacaacgttg	cgcaaactat	taactggcga	actacttact	5340
ctagcttccc	ggcaacaatt	aatagactgg	atggaggcgg	ataaagttgc	aggaccactt	5400
ctgcgctcgg	cccttcgggc	tggctggttt	attgctgata	aatctggagc	cggtgagcgt	5460
gggtctcgcg	gtatcattgc	agcactgggg	ccagatggta	agccctcccg	tatcgtagtt	5520
atctacacga	cggggagtca	ggcaactatg	gatgaacgaa	atagacagat	cgctgagata	5580
ggtgcctcac	tgattaagca	ttggttaactg	tcagaccaag	tttactcata	tatacttttag	5640
attgatttaa	aacttcattt	ttaattttaa	aggatctagg	tgaagatcct	ttttgataat	5700
ctcatgacca	aaatccctta	acgtgagttt	tcgttccact	gagcgtcaga	ccccgtagaa	5760
aagatcaaag	gatcttcttg	agatcctttt	tttctgcgcg	taatctgctg	cttgcaaaca	5820
aaaaaaccac	cgctaccagc	ggtgggtttg	ttgccggatc	aagagctacc	aactcttttt	5880
ccgaaggtaa	ctggcttcag	cagagcgtag	ataccaaata	ctgtccttct	agtgtagccg	5940
tagttaggcc	accacttcaa	gaactctgta	gcaccgccta	catacctcgc	tctgctaata	6000
ctgttaccag	tggctgctgc	cagtggcgat	aagtctgtgc	ttaccggggt	ggactcaaga	6060
cgatagttag	cggataaggc	gcagcggctg	ggctgaacgg	ggggttcgtg	cacacagccc	6120
agcttgagc	gaacgaccta	caccgaactg	agatacctac	agcgtgagct	atgagaaagc	6180
gccacgcttc	ccgaagggag	aaaggcggac	aggtatccgg	taagcggcag	ggtcggaaca	6240
ggagagcgca	cgagggagct	tccaggggga	aacgcctggt	atctttatag	tcctgtcggg	6300
tttcgccacc	tctgacttga	gcgtcgattt	ttgtgatgct	cgtcaggggg	gcggagccta	6360
tggaaaaacg	ccagcaacgc	ggccttttta	cggttcctgg	ccttttgctg	gccttttgct	6420
cacatggctc	gacagatct					6439

<210> 63  
 <211> 77  
 <212> PRT  
 <213> Herpes simplex virus type 2

<400> 63  
 Thr Ala Pro Ile Thr Asp Val Ser Leu Gly Asp Glu Leu Arg Leu Asp  
 1 5 10 15  
 Gly Glu Glu Val Asp Met Thr Pro Ala Asp Ala Leu Asp Asp Phe Asp  
 20 25 30  
 Leu Glu Met Leu Gly Asp Val Glu Ser Pro Ser Pro Gly Met Thr His  
 35 40 45  
 Asp Pro Val Ser Tyr Gly Ala Leu Asp Val Asp Asp Phe Glu Phe Glu  
 50 55 60  
 Gln Met Phe Thr Asp Ala Leu Gly Ile Asp Asp Phe Gly  
 65 70 75

<210> 64  
 <211> 44  
 <212> PRT  
 <213> Herpes simplex virus type 2

<400> 64  
 Ala Asp Ala Leu Asp Asp Phe Asp Leu Glu Met Ala Asp Ala Leu Asp  
 1 5 10 15  
 Asp Phe Asp Leu Glu Met Ala Asp Ala Leu Asp Asp Phe Asp Leu Glu  
 20 25 30  
 Met Ala Asp Ala Leu Asp Asp Phe Asp Leu Glu Met  
 35 40

<210> 65  
 <211> 10  
 <212> DNA

<213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 65  
 actttatttt 10  
 <210> 66  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 66  
 gagttttttcc 10  
 <210> 67  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 67  
 gatgggattt 10  
 <210> 68  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 68  
 tctttttgtt 10  
 <210> 69  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> engineered DNA response element  
 <400> 69  
 gagttggcgg 10  
 <210> 70  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> engineered DNA response element  
  
 <400> 70  
 tctggttggt 10  
  
 <210> 71  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 71  
 gagttttgtt 10  
  
 <210> 72  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 72  
 ccagggccccc ga 12  
  
 <210> 73  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 73  
 gccgcggtct gt 12  
  
 <210> 74  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element  
  
 <400> 74  
 cgtccgcggt ga 12  
  
 <210> 75  
 <211> 12  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> engineered DNA response element

<400> 75  
tttactttatt tt

12

<210> 76  
<211> 7  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> engineered DNA response element

<400> 76  
gagtttt

7

<210> 77  
<211> 9  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> sequence complementary to SEQ ID No:33

<400> 77  
aaaacttta

9